

Remarks

Claims 1-20, 22 and 24 were presented in Amendment A. In the present office action, the Examiner has rejected claims 1-20, 22 and 24. By this amendment, claims 1, 9 and 17 have been amended. Thus, claims 1-20, 22 and 24 remain in this application.

The examiner rejected claims 1, 3-6, 9, 11-15, 17-18, 20, 22 and 24 under 35 USC §102(b) as being anticipated by Hirata et al., US Patent No. 5,056,058. Before an analysis of the examiner's rejections of specific claims is undertaken, a brief overview of Hirata, vis-à-vis the present invention is considered relevant.

Hirata teaches prediction of communication between a first communication control equipment and a second communication control equipment within a predetermined communication protocol [see Abstract, lines 2-5]. That is, Hirata presumes a particular communication protocol (such as TCP/IP), and then predicts a next TYPE of communication between the first communication control equipment, and the second communication control equipment, based on the previously transmitted frame [see Abstract lines 5-10. Also see claim 1, lines 3-4]. The TYPE of communication that is predicted is Data Transfers versus Acknowledgements [see Figure 5 and associated text]. Hirata thus presumes a defined protocol, and frame specifics such as the source of transfer, the destination of transfer, the size of the transfer etc. That is, Hirata already knows that the protocol is fixed. And, Hirata knows what the source and destination of a packet is. All that Hirata predicts is whether the next frame between a source and a destination is another transfer frame, or an acknowledgement, as well as a few other TYPES of communication within the fixed protocol. This was particularly pointed out in the previous amendment.

In contrast, Applicant's invention DOES NOT presume a source, a destination, a size, a protocol, or any other attribute about a packet, NOR is applicant concerned about predicting the TYPE of frame (i.e., data transfer versus acknowledgement). Rather, Applicant is concerned about predicting information within specific packets, received from many different sources, and destined for many different destinations, having varying sizes of transfer, and using different protocols (UDP, TCP/IP, etc.). That is, it is not the TYPE of frame that is being predicted, but the specific information within packets

that is necessary for ROUTING of the packets between sources and destinations, such as must be performed by routers. More specifically, Routers receive packets from thousands of different sources, destined for thousands of destinations, of varying sizes, and of *different protocol*. All of the information within each packet received by a router must be processed, to determine its origin, its destination, its size, its protocol, etc. It is the prediction of this information, and the processing of this information, to reduce latency typically associated with processing after packets are received to which the present invention is directed. Nothing in Hirata teaches, suggests, or even hints at this novel invention, because Hirata does not appreciate how packets from *different* data flows, much less different data flows using different protocols, could be predicted. As mentioned above, Hirata PRESUMES that his protocol is FIXED, and that there are NOT different, or a plurality of data flows.

With respect to claim 1, it is repeated below, as amended, for ease of reference:

1. (currently amended) A packet buffering system for predictively processing data packets in a data packet network, the data packets associated with a plurality of data flows, the data flows from of a plurality of protocols, the system comprising:
 - at least one input port for receiving data packets from a plurality of sources, wherein the received data packets arrive from the plurality of data flows, interspersed;
 - at least one output port for sending out data packets to a plurality of destinations;
 - a packet predictor, coupled to said at least one input port, for predicting information about a future packet in any one of the plurality of data flows based on history of previously received packets from the plurality of data flows, said history stored in a memory coupled to said packet predictor;
 - a plurality of queues for storing packets received from said plurality of sources, and for storing said predicted information about said future packet;
 - direction logic, coupled to said packet predictor, for generating a Packet ID for said future packet which is stored in one of said plurality of queues;

buffer logic, coupled to said packet predictor, for validating said predicted information about said future packet based on access to said memory; and
a processing core, coupled to said plurality of queues, wherein if said buffer logic validates said predicted information, notification is made to said direction logic which passes said Packet ID for said future packet to said processing core to initiate speculative processing.

Nothing in Hirata teaches an input port for receiving data packets from a plurality of sources (Hirata must know the source of a frame); nore does Hirata teach that the data packets are received, interspersed, from a plurality of data flows; one output port for sending out data packets to a plurality of destinations (Hirata must know the destination of a packet); a plurality of queues for storing predicted information about a future packet (Hirata teaches predicting the TYPE of communication (transfer, acknowledge, etc.) NOT the information within a packet that defines source, destination, protocol, size, etc.); a packet predictor for predicting information about a future packet *in any one of the plurality of data flows* (Hirata does not even hint at multiple data flows, much less interspersed data flows); based on history of previously received packets (Hirata does not use history for packets, because Hirata is only dealing with data transfer types versus acknowledgements within a predetermined communication protocol); or a processing core for processing predicted information about a future packet. In view of the foregoing amendment, and the clarifications between Hirata and the present invention, application respectfully requests the examiner to withdraw his rejection of this claim.

With respect to claims 2-8, these depend either directly or indirectly from claim 1 and add further limitations that are neither anticipated nor obviated by Hirata. For all of the above reasons, applicant respectfully requests the examiner to withdraw his rejections of these claims.

With respect to claims 9 and 17, they have been amended to substantially comport to the amendments made to claim 1, which require that the packet predictions for future packets be associated with a plurality of data flows, utilizing a plurality of protocols. As mentioned above, nothing in Hirata is directed at PACKET prediction, much less PACKET prediction for packets received from a plurality of data flows. For these

reasons, and those indicated above with respect to claim 1, applicant respectfully requests that the examiner withdraw his rejection of this claim.

With respect to claims 10-16, 18-20, 22, and 24 these depend from claim 9 (or 17) and add further limitations which are neither anticipated nor obviated by Hirata. For all of the above reasons, application respectfully requests the examiner to withdraw his rejections of these claims.

Applicant earnestly requests that the Examiner contact the undersigned practitioner by telephone if the Examiner has any questions or suggestions concerning this amendment, the application, or allowance of any claims thereof.

Respectfully submitted,

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